

The Development of Polarimetric and Nonpolarimetric Multiwavelength Focal Plane Arrays, Phase I

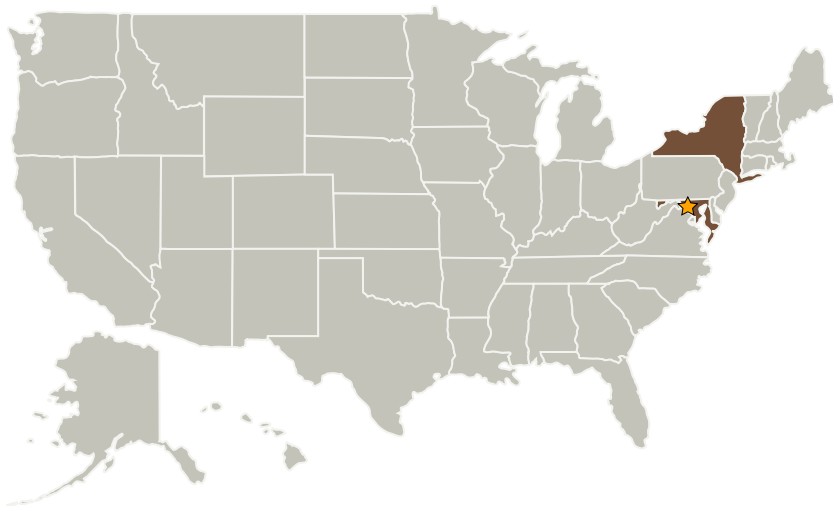
Completed Technology Project (2009 - 2009)



Project Introduction

High-performance polarimetric and nonpolarimetric sensing is crucial to upcoming NASA missions, including ACE and CLARREO and the multi-agency VIIRS NPP project. The objective of the proposed project is to use plasmonic/photonic hybrid crystals to develop multiwavelength polarimetric focal plane arrays (FPAs) that exceed performance requirements for ACE and CLARREO, while reducing costs through component integration. Plasmonic/photonic hybrid crystal films are an enabling technology and can be used to develop high spectral resolution, low crosstalk components for other NASA missions, such as GEO-CAPE, as well as transparent metal contacts for high-efficiency sensors and solar cells. Additionally, hybrid crystals eliminate several problems, such as diffraction, light scattering, moving parts, and the need to dice/bond components. This project will use recent discoveries in Plasmonic and Photonic Crystals research that allow for polarimetric control of the flow and super focusing/beaming of light, concepts that have been analytically and experimentally verified. The polarimetric control of the flow of light allows the development of devices that separate polarization components of an incident beam and detect the separate components in the same or different pixels of a FPA. The hybrid crystals can play several roles, including polarization splitter/filters, antireflection coatings, superfocusing elements and electrical contacts.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Phoebus Optoelectronics, LLC	Supporting Organization	Industry	Brooklyn, New York

Primary U.S. Work Locations	
Maryland	New York

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.3 Aero Propulsion
 - └ TX01.3.9 Hybrid Electric Systems